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FEATURES OF GASTRODUODENAL PATHOLOGY IN CHILDREN WHO SUFFERED FROM PEPTIC ULCER DISEASE

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Abstract. As is known, the formation and formation of the immune system is a process that is determined by the interaction of the gene regulation of development with environmental factors (antigens). Peptic ulcer of the stomach and duodenum is a chronic recurrent disease that occurs with alternating periods of exacerbation and remission, the main morphological feature of which is the formation of ulcers in the stomach and / or duodenum. The ulcerative defect penetrates through the muscle plate of the mucous membrane into the submucosal base or deeper. Under normal conditions, aggressive and protective factors are balanced, and therefore damage to stomach cells does not occur, however, in case of violation of this balance, damage to the mucosa in the form of erosions and / or ulcers may occur. Protective factors are represented by three components: preepithelial, epithelial, and postepithelial. The preepithelial mucus includes mucin, bicarbonates and surfactant phospholipids. The epithelial component includes surface cells, their apical dense contacts and membrane transporters.

Keywords: children, gastroduodenitis, gastric ulcer, immunology.

Introduction

In recent years, there has been an increase in gastroduodenal diseases in all countries of the world[1]. Despite the progress made in the diagnosis and treatment of gastroduodenal pathology throughout the world, the implementation of organizational and medical measures, this problem remains relevant. Helicobacter pylori infection is one of the causes of the development of diseases of the gastroduodenal system, such as gastritis, gastroduodenitis, lymphoma, and gastric cancer. This infection is widespread throughout the world, according to "... up to 50% of the world's population is infected with Helicobacter pylori infection." [2].

As is known, the formation and formation of the immune system is a process that is determined by the interaction of gene regulation of development with environmental factors (antigens)[3]. At certain stages of growth, gene depression and switching of gene regulation of the phenotype and, especially, the functions of immunocompetent cells occur. The periods of manifestation of such changes in genetic control are proposed to be called critical [4].

According to the concept of J.B. Solomon (1978), in human ontogeny there are so-called milestones or milestones that mark transitional periods of general development and equivalent states of the immune system[5]. Since the selected contingent of child patients was from 7-18 years old, and this age period, according to the concept, corresponds to the

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end of the fourth and fifth critical periods of the formation of the human immune system, the so-called adolescence [6].

In these periods, the system of local immunity completes its development. [7] Many chronic diseases of a polygenic nature are formed[8]. Since the hypothalamic-pituitary-gonadal axis is in reciprocal relationship with the immune system, the pubertal growth spurt combined with a decrease in the mass of lymphoid organs, and an increase in the secretion of sex hormones (primarily androgens) leads to suppression of the cellular link of immunity and stimulation of its humoral link. In particular, the strong and weak types of the immune response are finally formed. The impact of exogenous factors on the immune system is enhanced [9].

To determine the immunological aspects of gastroduodenal pathology associated with Helicobacter pylori in children

MATERIALS AND METHODS

To confirm the Helicobacter pylori genesis of the disease, an enzyme immunoassay was performed to determine IgG antibodies to HP. Determination of IgG in blood serum to the CagA antigen of H. Pylori was carried out using the Vector-Best test system (Novosibirsk) in 182 schoolchildren[10].

Immunogenetic studies were carried out at the Institute of Immunology and Human Genomics of the Academy of Sciences of the Republic of Uzbekistan. The results of a survey of healthy children of this institute were used as a control[11].

According to the objectives of the work, out of the entire cohort of examined children, children with HP associated (GDP + HP) and non-associated (GDP without HP) gastroduodenal pathology were included in the study. We conducted a study of immune response mediators using IL-1β and TNFα as an example in 165 sick children and, for comparison, in 50 practically healthy children of the same age who made up the control group[12].

As it turned out, the formation and formation of the system is a process that decides the interaction of gene regulation of development with environmental factors (antigens). Against the background of a sharp increase, gene depression and the development of gene regulation of the phenotype and features of the functions of immunocompetent cells are observed. Periodic manifestations of such changes in the genetic control of assemblies[13].

In these periods, the system of local immunity completes its development[14]. Many chronic diseases of a polygenic nature are formed. Since the hypothalamic-pituitary-gonadal axis is in reciprocal relationship with the immune system [15], the pubertal growth spurt is combined with a decrease in the mass of lymphoid organs, and an increase in the secretion of sex hormones (primarily androgens) leads to suppression of the cellular link of immunity and stimulation of its humoral link. In particular, the strong and weak types of the immune response are finally formed. The influence of exogenous factors on the immune system increases [16].

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Based on the above, the groups of children with GDP + HP and GDP without HP were divided into 2 subgroups depending on age. The distribution of patients by age groups was as follows[17].

TABLE1.1

Distribution of the examined children by age groups

Age of patient	Control gr	GDP H. pylori (+)	GDP H. pylori (-)	Total
7-14 y	22	35	33	90
15-18 y	28	58	39	125
Total	50	93	72	215

Cytokines are low molecular weight proteins, endogenous biologically active mediators that regulate intercellular interactions [18]. These regulatory peptides constitute the initial link in the activation of the immune response and determine the effectiveness and type of immune response to infectious and non-infectious agents [19]. In healthy people, cytokines are formed in small quantities, and in pathological conditions, their number increases significantly.

Undoubtedly, the role of cytokines in gastroduodenal pathology is very significant and diverse. This is determined by the pleiotropic effects of cytokines and consists in the regulation of proliferation, differentiation, and modulation of apoptotic cell death [20].

For the purpose of a more detailed and informative assessment of the content of the studied cytokines in sick children, we analyzed the synthesis of the studied pro-inflammatory cytokines in practically healthy children, depending on age aspects[21]. The data results are shown in Table 4.2.

TABLE1.2

Level of cytokines in practically healthy children, (M±m)

Cytokine, pg/ml	Age groups	
	From7-14 y, n=22	from 15 -18 y, n=28
IL-1β	21,6±0,86**	24,2±0,72*
TNFα	23,8±0,83**	27,4±0,76*

It is known that the function of cytokine regulation is to ensure the main stages of the life of a cell of the body, such as proliferation, differentiation and functioning of cells, as well as the direction and nature of the immune response to the introduction of pathogens of

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infectious and non-infectious genesis[23]. Cytokines, interacting with complementary receptors on the cell surface, activate certain genes, and specific proteins are synthesized that regulate the processes listed above. According to the literature data, the content of interleukins in the blood serum depends on their entry into the blood and the involvement of systemic immune responses in the inflammatory response[24]. The concentration of cytokines in the bloodstream is influenced by the duration of the disease and the frequency of relapses, therefore, we decided to compare the selected pathologies and show them in tab. 1.3[25].

TABLE 1.3

The level of cytokines in the examined groups of children from 7 to 14 years old, (M±m)

Cytokine	Control gr, n=22	GDP + H. pylori , n=35	GDP abs H. pylori , n=33
IL-1β, pg/ml	21,6±0,86	47,9 ± 0,96*	37,3 ± 0,80*
TNFα, pg/ml	23,8 ± 0,83	52,4 ± 0,83*	33,8 ± 0,78*

Thus, when assessing the cytokine index, it was found that the level of interleukin-1β was higher in sick children, and in children with HDP + HPn it was 2.2 times higher than in the control group (47.9 ± 0.96 pg/ml vs. 0.80 pg/ml, P<0.001).

The increased level of IL-1β in the blood serum in children with HDP+HP is explained by the fact that HP plays a significant role in the development of acid-dependent diseases of the gastrointestinal tract. Under the influence of this pathogen on the mucous membrane of the stomach and duodenum, IL-1β is the first to be included in the protective response of the body and plays a leading role both in the development and in the regulation of nonspecific protection and specific immunity, i.e., in response to HP infection, the synthesis of cytokines in the cells of the gastric mucosa increases.

Elevated levels of IL-1β and TNF-α in children with gastroduodenal pathology associated with H.pylori reflect higher inflammatory activity (Table.1.3.)

Analysis of the results of a study on the level of IL-1ß in the peripheral blood serum of adolescents in both groups showed significantly increased values. Thus, in the group of children with H.pylori "+", the concentration of IL-1ß averaged 79.6± 1.10 pg/ml, which is 3.3 times higher than the values of the control group (24.2± 0.72 pg/ml) (P<0.001.), while in the group of children with H.pylori "-" the level was on average, 49.3±0.65 pg/ml, which is 1.6 times lower than the indicators of the main group (P<0.001.). In H.pylori negative adolescents, the serum TNFa level was 50.5± 0.60 pg/ml, which is 1.8 times higher than in the control group (27.4±0.76 pg/ml, P<0.001) . At the same time, in H.pylori positive children, an increased TNFa level was recorded, which exceeded the data of children H.pylori of the negative group by 2.4 times (P<0.001.), and the data of the control group by 2.4 times, averaging 63.1±0.93pg/ml, (P<0.001). According to the mechanism described after infection of the gastric mucosa, H.pylori triggers a cytokine cascade, which primarily leads to increased expression of IL-1ß, and it first activates neutrophils (increases chemotaxis and phagocytosis). Normally, neutrophils are the first to migrate to the focus of inflammation under the action of H.pylori-induced chemoattractants and destroy bacteria by phagocytosis. However, bacterial infection with H.pylori is able to change the direction of

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the immune response, which leads to the pathogen's departure from immunological supervision and the imperfection of the immune response, therefore, to the ineffectiveness of the work of the nonspecific link of immunity. Hyperproduction of IL-1ß can lead to inhibition of hydrochloric acid production in the stomach, which contributes to the colonization of H.pylori. Prolonged hypersecretion of cytokine leads to depletion of the reserve capabilities of producing cells, and, subsequently, to immunodeficiency, which contributes to the formation of a focus of chronic inflammation.

TABLE 1.4

Cytokine content in the examined groups of children from 15 to 18 years, (M±m)

Cytokine	Control gr, n=22	H. pylori «+», n=35	H.pylori «-», n=33
IL-1β, pg/ml	24,2±0,72	79,6 ± 1,10*	49,3 ± 0,65*
TNFα, pg/ml	27,4 ± 0,76	63,1 ±0,93*	50,5 ± 0,60*

The increased level of IL-1ß and TNF-α in children with GDP associated with HP reflects higher inflammatory activity (Table 1.4.).

Analysis of the results of a study on the level of IL-1ß in the peripheral blood serum of adolescents in both groups showed significantly increased values.So in a group of children with GDP + The HP concentration of IL-1ß averaged 79.6± 1.10 pg/ml, which is 3.3 times higher than the values of the control group (24.2± 0.72 pg/ml) (P<0.001.), while in the group of children with GDP without HP, the level averaged 49.3±0.65 pg/ml, which 1.6 times lower than the indicators of the main group (P<0.001.). When studying the serum TNFa level in adolescents with GDP without HP, it was revealed that on average it was 50.5± 0.60 pg/ml, which is 1.8 times higher than the control group (27.4±0.76 pg/ml, P<0.001) (Fig.4...). At the same time, in children with GDP + HP, it was fixed increased TNFa level, which exceeded the data of children with GDP without HPv 2.4 times (P<0.001.), and the data of the control group 2.4 times, averaging 63.1±0.93pg/ml, (P<0.001).

Fig. 1.1. Comparative indicators of the examined children

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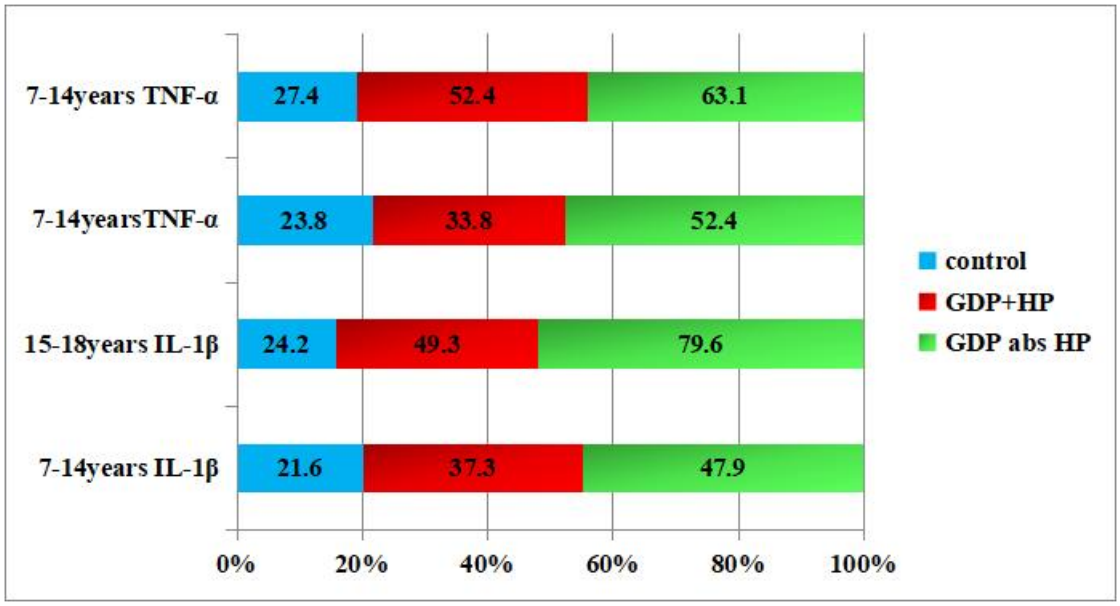

CONCLUSIONS

Thus, the revealed features are consistent with the literature data on the importance of these factors in the formation of HP-associated pathology in children. Studies conducted to study the state of the immune system in children with gastroduodenal pathology not associated with NRi in children with gastroduodenal pathology associated with NRI have revealed the direction of immune shifts and their severity, which indicates an important pathogenetic role of immune mechanisms in the development and progression of changes in the state of the immune system of children with diseases of the digestive system. An increase in the production of the studied Th1 helper cytokines indicates the activation of Th1-type immunity in GDP associated with HP. At the same time, an increase in the concentration of cytokines in the blood serum more clearly reflects the dynamics of the pathological process.

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